



## **EAC Decision on Request for Interpretation 2012-03 (Configuration Management of COTS Products)**

### **2005 VVSG Volume I, Sections 9.1.1 & 9.1.3**

***Date:***

May 30, 2012

***Question:***

How should voting system manufacturers handle the volatile nature of the COTS product marketplace while still meeting the configuration management requirements of the VVSG?

***Section of Guidelines:***

Section 9 of the 2005 Voluntary Voting System Guidelines (VVSG) defines configuration management as “a set of activities and associated practices that ensures full knowledge and control of the components of a system, starting with its initial development and progressing through its ongoing maintenance and enhancement.”

### **9.1.1 Configuration Management Requirements**

Configuration management addresses a broad set of record keeping, auditing, and reporting activities that contribute to full knowledge and control of a system and its components. These activities include:

- Identifying discrete system components
- Creating records of a formal baseline and later versions of components
- Controlling changes made to the system and its components
- Releasing new versions of the system
- Auditing the system, including its documentation, against configuration management records
- Controlling interfaces to other systems
- Identifying tools used to build and maintain the system.

### **9.1.3 Application of Configuration Management Requirements**

Requirements for configuration management apply to all components of voting systems regardless of the specific technologies employed. These components include:

- Software
- Hardware
- Communications

- Documentation
- Identification and naming conventions (including changes to these conventions) for software programs and data files
- Development and testing artifacts such as test data and scripts
- File archiving and data repositories

### ***Discussion:***

As Commercial Off-the-Shelf (COTS) products become more prevalent and more integrated into voting systems, voting system manufacturers and, ultimately, election officials are impacted by the ebb and flow of the COTS product lifecycle. “Life Cycle” as used here refers to the period of time during which a COTS hardware or software product remains attainable to a voting system manufacturer and remains useful to an election jurisdiction. For example, the demand for more economical, higher performance and faster processing capabilities makes new models of COTS computers obsolete in a relatively short amount of time, which has resulted in an estimated lifespan of between 3 to 4 years for items such as laptops. The end-of-life of a laptop computer, or other COTS components, generally occurs when the component no longer meets consumer requirements (i.e., cheaper, better, faster) or when it simply ceases to function properly.

The proliferation of COTS products and the volatility of the commercial marketplace in dictating a product’s end-of-life constitute an enormous challenge for both the EAC certification program and for a voting system manufacturer’s configuration management. In order to begin to mitigate COTS related issues in voting systems, additional emphasis must be placed on the Configuration Management Requirements of Section 9 of the VVSG.

Rigorous configuration management procedures are critical in COTS-based systems. Issues that manufacturers must address include: change history for each individual COTS component; availability and support level provided by the component’s vendor; management of configurations of the COTS-based system that are installed at each jurisdiction; monitoring field experience; testing of new COTS versions and compatibility requirements and constraints between COTS components.

The scope of Configuration Management as outlined in Section 9.1 states: “This section describes activities in terms of their purposes and outcomes. It does not describe specific procedures or steps to be employed to accomplish them.” The issues related to sustainability and cost of maintaining the status quo of COTS usage in voting systems requires an expanded interpretation of the requirements of Section 9.1.1. Specifically, the requirements related to identifying discreet system components, controlling changes made to the system and its components, auditing the system including its documentation against configuration management records, and controlling interfaces to other systems, require clarification.

A significant aspect of variation in COTS components is how sensitive the voting system design is to each COTS component. Some designs can be very sensitive to changes and require careful control. Other designs can more tolerant of variation in a COTS component and provide more robust error detection if a component falls outside of system requirements. The burden to the

Configuration Management plan can be increased or decreased based on how sensitive or protected the system design is to variation in a COTS component.

To meet the requirements of Section 9 of the VVSG and to better mitigate the effects of constantly changing COTS products, voting system manufacturers **shall**:

- For each test engagement, submit to the EAC and the VSTL a **COTS Product Implementation Plan**. The plan shall, at a minimum, include a list of all COTS products, list the expected end-of-life date of each product, and describe the manufacturer's proposed plan for replacing end-of-life components with an equivalent COTS component.
- Allow the VSTL at the beginning and end of each test engagement to perform a random spot check of listed COTS components to verify that none of the components have been deemed to be considered end-of-life by the COTS manufacturer.

To better manage the lifecycle of COTS components used in a voting system, voting system manufacturers **should**:

- Perform continuous market research to identify alternative COTS components, vendors and market trends throughout the system's life cycle.
- Utilize market research to track technology trends, anticipate future products releases, and have an understanding of applicable COTS vendors' plans.
- Maintain a preferred vendor list for all COTS components.
- Stay in contact with customers regarding the COTS products they are purchasing and any field issues that arise with them.
- Consider including a refresh cycle before final testing and fielding of the voting system so that COTS components are not at or near end-of-life within months or years of product development and initial testing

### ***Conclusion:***

To address the realities of using COTS products and to mitigate some of the consequences of using ever changing COTS components in voting systems, the EAC interprets Section 9 of the VVSG as requiring voting system manufacturers to submit, to the EAC and the VSTL's a COTS Product Implementation Plan for each test engagement. The plan shall, at a minimum, include a list of all COTS products, list the expected end-of-life date of each product, and describe the manufacturer's plan for replacing end-of-life components with an equivalent COTS component. The VSTL shall conduct a random spot check of COTS products associated with the voting system under test both at the beginning and the end of the test engagement to verify that none of the COTS products listed have reached their end-of-life.

### ***Effective Date:***

Effective immediately for all systems without an approved application.